REMARKS

Foreign Priority

The Office Action has not acknowledged a claim for foreign priority under 35 U.S.C. § 119 (a)-(d), which is contained in the Declaration and Power of Attorney. Submitted herewith is a copy of the postcard receipt showing that the U.S. Patent and Trademark Office acknowledged receipt of the Certified Copy of Priority Document on February 23, 1999. Acknowledgement of our claim for foreign priority and acknowledgement of receipt of the priority document is respectfully requested.

Status Of Application

Claims 1-30 were pending in the application; the status of the claims is as follows:

Claims 1-14, 17-24, and 27-30 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,246,804 B1 to Sato et al. (hereinafter "the Sato patent").

Claims 15, 16, 25, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Drawings

The indication, in the Notice of Draftsperson's Patent Drawing Review, that the Official Draftsperson has no objections to the drawings, is noted with appreciation.

Claim Amendments

Claims 1-30 have been amended to provide proper antecedent basis and to more particularly point out and distinctly claim the invention.

New Claims

Claims 31-33 have been added to provide a more adequate basis of protection for the invention. Support for the claims can be found throughout the specification and claims. No new matter was added.

Allowable Subject Matter

The indication that claims 15, 16, 25, and 26 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, is noted with appreciation.

35 U.S.C. § 102(e) Rejection

The rejection of claims 1-14, 17-24, and 27-30 under 35 U.S.C. § 102(e) as being anticipated by the Sato patent, is respectfully traversed based on the following.

The Sato patent is directed to an image retrieval apparatus and method which searches regions of a single target image (column 6, lines 4-7). A single image is selected as the designate image 100. Individual regions of the image files 109 are compared to the designated image using the description files 110 for each image column 6, lines 39-50). When a relative match is detected, the region information is added to a compound region memory 106, which provides a compound region for further comparison to the data from the description files.

In contrast to the cited prior art, Claim 1 includes:

> a specifying controller for specifying a plurality of key images,
> each of said plurality of key images having a respective plurality of
> features;
> an extracting controller for extracting common key image feature
> values for common key image features that are common to the plurality of
> key images;

Claim 1 requires an apparatus for specification of a plurality of key images. The cited reference only designates a single image. In addition, claim 1 requires the extraction of common key image features. The cited prior art works with plural regions,

but only in the same, single image. The invention of claim 1 provides greater image search accuracy by determining which image features are common in a selected set of key images (written description, page 31, line 16, to page 32, line 6). This is neither shown nor suggested in the prior art. A claim is anticipated only if every element of the claim is shown or suggested in the cited reference. MPEP § 2131. Because the cited reference does not show or suggest the quoted elements, claim 1 is not anticipated by the cited prior art. Claims 2 and 3 are dependent upon claim 1 and thus include every limitation of claim 1. Therefore, claims 1-3 are not anticipated by the cited prior art.

Also, in contrast to the cited prior art, claim 4 includes:

> a specifying controller for specifying a plurality of key images used to specify search conditions, each of said plurality of key images having a plurality of key image features, each of said plurality of key images having a common feature value for each of said plurality of key image features;
> a calculating controller for comparing the plurality of key images, specified by the specifying controller, with the plurality of database images to thereby calculate similarities between the common feature value for each of the plurality of key image features and a corresponding one of the plurality of database image features for each of the plurality of database images;

As noted above, the cited prior art does not show or suggest an apparatus that selects a plurality of key images and determines the common features of the key images. Therefore, claim 4 is not anticipated by the cited prior art. Claims 5 and 6 are dependent upon claim 4 and thus include every limitation of claim 4. Therefore, claims 4-6 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 7 includes:

> a specifying controller for specifying a plurality of key images used to specify search conditions;
> a first calculating controller for comparing a feature value calculated for each common feature of the plurality of key images to thereby calculate a first degree of similarity for each of said plurality of database images;

As noted above, the cited prior art does not show or suggest an apparatus that selects a plurality of key images and determines the common features of the key images.

Therefore, claim 7 is not anticipated by the cited prior art. Claims 8-10 are dependent upon claim 7 and thus include every limitation of claim 7. Therefore, claims 7-10 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 11 includes:

specifying a plurality of key images used to specify search conditions;
extracting common feature values from the plurality of key images;
comparing the common feature values with the feature values of the plurality of database images to thereby sequentially calculate similarities between the common feature values and the database image feature values;

The cited prior art does not show or suggest a method including specifying a plurality of key images, determining common feature values of those key images and comparing those common feature values to an image database. The cited prior art designates a single image and then compares regions of that image to regions of the database images. Determining the common features of a single image is a non sequitur. There is no suggestion of determining any common features between the regions in the cited prior art. Therefore, the cited prior art does not show or suggest every element of claim 11. Claims 12 and 13 are dependent upon claim 11 and thus include every limitation of claim 11. Therefore, claims are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 14 includes:

specifying a plurality of key images used to specify search conditions, said plurality of key images having common features, said common features of said plurality of key images each having a key image feature value;
comparing the key image feature values of the plurality of key images with the plurality of database feature values of the plurality of database images to thereby calculate similarities between the key image feature values and the plurality of database image feature values;

As noted above, the cited prior art does not show or suggest selecting a plurality of key images and determining the common features of the key images. Therefore, claim 14 is not anticipated by the cited prior art. Claims 15 and 16 are dependent upon claim

14 and thus include every limitation of claim 14. Therefore, claims 14-16 are patentably distinct from the cited prior art.

Claim 17 is directed to an image searching method which comprises the steps of:

specifying a plurality of key images used to specify search conditions, said plurality of key images each having a plurality of common feature values, each of said common feature values corresponding to one of the features of the plurality of key images;
comparing the common feature values of the plurality of key images with respective feature values of the plurality of database images to thereby calculate first similarities therebetween;

As noted above, the cited prior art does not show or suggest selecting a plurality of key images and determining the common features values of the key images. Therefore, claim 17 is not anticipated by the cited prior art. Claims 18-20 are dependent upon claim 17 and thus include every limitation of claim 17. Therefore, claims 17-20 are patentably distinct from the cited prior art.

Also in contrast to the cited prior art, claim 21 includes

instructions for specifying a plurality of key images used to specify search conditions;
instructions for extracting common feature values of features of the plurality of key images;
instructions for comparing the common feature values with feature values of the plurality of database images to thereby sequentially calculate similarities between the common feature values of the plurality of key images and the database image feature values;

The cited prior art does not show or suggest a software program including instructions for specifying a plurality of key images, extracting common feature values and comparing the extracted common feature values to the database images. Therefore, claim 21 is patentably distinct from the cited prior art. Claims 22 and 23 are dependent upon claim 21 and thus include every limitation of claim 21. Therefore, claims 21-23 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 24 includes:

> instructions for specifying a plurality of key images having common feature values used to specify search conditions;
> instructions for comparing the plurality of key images with the plurality of database images to thereby calculate similarities between common feature values of the plurality of key images and the database image feature values;

The cited prior art does not show or suggest a software program including instructions for specifying a plurality of key images having common feature values and comparing the extracted common feature values to the database images. Therefore, claim 24 is patentably distinct from the cited prior art. Claims 25 and 26 are dependent upon claim 24 and thus include every limitation of claim 24. Therefore, claims 24-26 are not anticipated by the cited prior art.

Also in contrast to the cited prior art, claim 27 includes:

> instructions for specifying a plurality of key images used to specify search conditions, said plurality of key images each having a plurality of features;
> instructions for calculating feature values for each of the plurality of key images from the plurality of features for each of the plurality of key images;
> instructions for comparing the feature values of each of the plurality of key images with respective feature values of the plurality of database images to thereby calculate first similarities between the feature values of the plurality of key images and the feature values of the plurality of database images;

The cited prior art does not show or suggest a software program including instructions for specifying a plurality of key images, extracting common feature values and comparing the extracted common feature values to the database images. Therefore, claim 27 is patentably distinct from the cited prior art. Claims 28-30 are dependent upon claim 27 and thus include every limitation of claim 27. Therefore, claims 28-30 are not anticipated by the cited prior art.

Accordingly, it is respectfully requested that the rejection of claims 1-14, 17-24, and 27-30 under 35 U.S.C. § 102(e) as being anticipated by the Sato patent, be reconsidered and withdrawn.

NEW CLAIMS:

New claim 31 includes the limitations of:

specifying a plurality of key images used to specify search conditions, said plurality of key images each having a plurality of key image features each corresponding to at least one of a plurality of database features, said plurality of key images having a plurality of common features which are common to all of the plurality of key images;
calculating common key image feature values from the common features for each of the plurality of key images;
comparing the common feature values of the common features with corresponding database image features of the plurality of database images to calculate similarities therebetween;

The cited prior art does not show or suggest specifying a plurality of key images, calculating the common features of the key images and comparing the common features to the database image features. The cited prior art designates a single image and then compares regions of that image to regions of the database images. Therefore, claim 31 patentably distinct from the cited prior art.

New claim 32 provides a computer program product including the steps of:

specifying a plurality of key images used to specify search conditions;
calculating common feature values of the plurality of key images by comparing the plurality of key image features for each of the key images to determine feature values which are common to all of the plurality of key images;
comparing common feature values of the plurality of key images with the database image feature values of the plurality of database images to calculate similarities therebetween;

The cited prior art does not show or suggest specifying a plurality of key images, calculating the common features of the key images and comparing the common features to the database image features. The cited prior art designates a single image and then compares regions of that image to regions of the database images. Therefore, claim 32 patentably distinct from the cited prior art.

New claim 33 depends from claim 1 and thus includes every limitation of claim 1. As noted above, the cited prior art does not show or suggest every limitation of claim 1. Therefore, the cited prior art does not show or suggest every limitation of claim 33 and claim 33 is patentably distinct from the cited prior art.

Accordingly, it is respectfully requested that a new claims 31-33 be allowed.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment increases the number of independent claims by 2 to 11 from 9 independent claims and increases the total number of claims by 3 to 33 from 30, but does not present any multiple dependency claims. Accordingly, a Response Transmittal and Fee Authorization form, authorizing the amount of $222.00 to be charged to Sidley Austin Brown & Wood's Deposit Account No. 18-1260, is enclosed herewith in duplicate. However, if the Response Transmittal and Fee Authorization form is missing, insufficient, or otherwise inadequate, or if an additional fee, other than the issue fee, is required during the pendency of this application, please charge such fee to Sidley Austin Brown & Wood's Deposit Account No. 18-1260. Please credit any overpayment to Sidley Austin Brown & Wood's Deposit Account No. 18-1260.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

The following is a marked-up version of the changes to the title, specification and claims which are being made in the attached response to the Office Action dated July 3, 2001.

IN THE TITLE:

The title on page 1, line 1:

[Image searching system and image searching method, and a
recording medium storing an image searching program]

IMAGE SEARCHING SYSTEM, IMAGE SEARCHING METHOD, AND RECORDING MEDIUM STORING AN IMAGE SEARCHING PROGRAM

IN THE SPECIFICATION:

The paragraph beginning at page 25, line 7, and ending at page 25, line 12:

Next, the processing for calculating the degree of similarity (step S46 in Fig. 6) is described below. Based on the common [feature quantities] features extracted from the key images and a target image, this processing calculates the degree of similarity of the target image to all key images or any [either] one of them.

The paragraph beginning at page 25, line 17, and ending at page 25, line 25:

Accordingly, [feature quantities] features other than common [feature quantities] features are not used for the calculation of the degree of similarity. Due to this, images having features common to plural key images can be obtained

as the results of the search with a high accuracy. In this case, the target image is similar to all of the plural key images. In other words, this search method imposes a search under an AND condition among the key images and thereby, enables a user to restrict ranges of searching conditions to reasonable ones.

The paragraph beginning at page 26, line 1, and ending at page 26, line 18:

Fig. 11 shows an example of the calculation for the degree of similarity. In this example, the distance between each key image and the target image is calculated based on the values of feature quantity 2 and feature quantity 3 selected as the common [feature quantities] features and the degree of similarity is obtained based on the calculated distances. The values shown in Fig. 11 are obtained from the following equations (1) to (3).

Difference between [feature quantities] features = | (key image feature quantity)-(target image feature quantity) | (1)

[Distance = square root of sum of (each feature quantity difference $)^2$ (2)]

Distance = square root of {the sum of (each feature quantity difference$)^2$} (2)

Degree of similarity = 1.0/distance   (3)

The paragraph beginning at page 26, line 19, and ending at page 27, line 7:

According to a second embodiment, the degree of similarity between a target image and key images is calculated for each of the key images based on [feature quantities] features of all kinds. From the degrees of similarity calculated for each key image, the highest degree of similarity is then selected as the degree of similarity of the target image to the corresponding key image. In this case, images similar to at least one of the plural key images are searched. That is, the image search is performed under an OR logic condition and, accordingly, it becomes possible to broaden the ranges of searching conditions by increasing the number of key images. [Second] The second embodiment performs a processing shown in Fig. 12 and Fig. 13 instead of Figs. 6 and 7 of the first embodiment.

The paragraph beginning at page 27, line 8, and ending at page 27, line 13:

Referring to Fig. 12, a plurality of key images specified by a user are read [at first] (S141). [Feature quantities] Features are obtained from the image database 50 for each key image (S142). Namely, [feature quantities] features of plural kinds such as color, shape, texture and the like are obtained [form] from each key image.

The paragraph beginning at page 27, line 21, and ending at page 28, line 10:

At first, it is determined whether or not there is a target image in the image database for which the degree of similarity to each key image has not yet been calculated (step S143). If such a target image is present in the image database 50, the [feature quantities] features for that target image are read from the image database (step S144). Then, calculation of the degree of similarity indicative of the similarity between images is performed based on the [feature quantities] features of each key image and those of the target image (step S144). After this calculation, the processing loops back to step S143. This calculation processing of the degree of similarity (step S145) will be described later. These steps S143 to S145 are repeated until the similarity calculation has been completed for all target images in the image database 50.

The paragraph beginning at page 29, line 11, and ending at page 29, line 16:

As shown in Fig. 14, a distance between a feature quantity of the key image and that of the same kind of the target image is calculated for each of all [feature quantities,] the features, and a distance between the key images and the target image is calculated based on the distances of respective [feature quantities.] features.

The paragraph beginning at page 31, line 5, and ending at page 31, line 12:

An example of the calculation of the degree of similarity is shown in Fig. 15. In this example, the weight for the degree of similarity a calculated in Fig. 11 is set larger than that for the degree of similarity b calculated in Fig. 14. A weighted mean value is [than] then calculated to obtain the final degree of similarity c. This final degree of similarity c is obtained according to the next equation (7).

The paragraph beginning at page 31, line 16, and ending at page 32, line 6:

As stated above, according to the present embodiment, [feature quantities] features are extracted from a plurality of key images, when specified and those common to the plural key images are selected to determine similarity between images using these common [feature quantities.] features. Thus, the common [feature quantities] features are automatically determined from among plural key images and accordingly, the user burden can be reduced. It is also possible to search for images having features common to plural key images. This enables the user to narrow the ranges of respective searching conditions by specifying plural key images. Also, the search can be similarly expanded to broader ranges of searching conditions by considering the degree of similarity indicating similarity of an image to at least one of plural key images. Search accuracy can be thus improved.

IN THE CLAIMS:

1.   (Once Amended) An image searching system comprising:

an image database storing a plurality of database images, each of said plurality of database images having a plurality of features; [images to be searched for;]

a specifying controller for specifying a plurality of key [images used to specify search conditions;] images, each of said plurality of key images having a respective plurality of features;

an extracting controller for extracting common key image feature values [of common images from the plural] for common key image features that are common to the plurality of key [images specified by the specifying controller;] images;

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a calculating controller for comparing the common <u>key image</u> feature values, extracted by the extracting controller, with the <u>respective</u> feature values of the [plural] <u>plurality of</u> database images to thereby sequentially calculate similarities between <u>each of</u> the common <u>key image</u> feature values and <u>respective ones of</u> the database image feature [values;] <u>values for each of the plurality of database images;</u> and

a searching controller for retrieving from the database [images] <u>at least</u> one of the <u>plurality of database</u> images which is similar to the <u>plurality of</u> key [image,] <u>images,</u> based on a similarity calculated by the calculating controller.

2. (Once Amended) [The] <u>An image searching</u> system as claimed in Claim 1, wherein the extracting controller includes:

an extracting <u>algorithm</u> [means] for extracting a plurality of types of [the feature quantities] <u>features</u> from the [respective] <u>plurality of</u> key images specified by the specifying controller;

a selecting <u>algorithm</u> [means] for comparing the [feature quantities,] <u>plurality of types of features</u> extracted by the extracting <u>algorithm, with</u> [means, among] the [plural] <u>plurality of</u> key images specified by the specifying controller to thereby select at least one of the types of the [feature quantities;] <u>features;</u> and

a determining <u>algorithm</u> [means] for determining the common [feature quantities] <u>key image features</u> based on the at least one type of the features [quantities] selected by the selecting <u>algorithm.</u> [means.]

3. (Once Amended) [The] <u>An image searching</u> system as claimed in Claim 2,

wherein the selecting <u>algorithm</u> [means] is operable to compare <u>common types of</u> the [feature quantities of the same types among] <u>features of respective ones of</u> the [plural] <u>plurality of</u> key images specified by the specifying [controller and] <u>controller,</u>

wherein the determining <u>algorithm</u> [means] is operable to calculate an average <u>similarity</u> value [of] <u>for</u> the <u>features</u> [feature quantities] of the [plural] <u>plurality of</u> key [image] <u>images</u> with respect to the <u>at least one type of the features</u> [types of the feature quantities] selected by the selecting <u>algorithm</u> [means,] to thereby determine the [calculated] average <u>similarity</u> value <u>for each of the at least one type of the features.</u> [as representing the common feature quantities.]

4. (Once Amended) An image searching system which comprises:

an image database storing a plurality of database images to be [searched for;] searched, each of said plurality of database images having a plurality of database image features;

a specifying controller for specifying a plurality of key images used to specify search [conditions;] conditions, each of said plurality of key images having a plurality of key image features, each of said plurality of key images having a common feature value for each of said plurality of key image features;

a calculating controller for comparing the [plural] plurality of key images, specified by the specifying controller, with the [plural] plurality of database images to thereby calculate similarities between the common feature [values] value for each of the plurality of key image features and a corresponding one of the plurality of database image [feature values;] features for each of the plurality of database images;

a selecting controller for retrieving a particular key image from the specified plurality of key images based on the similarities calculated by the calculating controller; and

a searching controller for retrieving [the] images from the plurality of database images based on the similarity between the particular key image, selected by the selecting controller, and the plurality of database images.

5. (Once Amended) [The] An image searching system as claimed in Claim 4, wherein the selecting controller is operable to select as a particular one of the [plural specified] plurality of key images, [the] a particular one of the plurality of key images which most [resemble to the database images] resembles an image being searched for.

6. (Once Amended) [The] An image searching system as claimed in Claim 5,

wherein the calculating controller is operable to calculate [a plurality of] the types of the [feature quantities from] features of the [plural] plurality of key images and then operable to calculate [a degree] degrees of similarity by comparing the key image features [feature quantities with the database image] for each of the plurality of key images with corresponding database feature quantities of the database images for each type of the features, [type, and]

wherein the selecting controller selects, as the particular key [image from the plural specified images, the] image, a one of the plurality of key images which most [resemble to the database images] resembles an image being searched for with respect to an average value of the degrees of [similarities] similarity calculated by the calculating controller [means] for each type of the [feature quantities.] features.

7.   (Once Amended) An image searching system which comprises:

an image database storing a plurality of database [images to be searched for;] images;

a specifying controller for specifying a plurality of key images used to specify search conditions;

a first calculating controller for comparing a feature value calculated for each common feature [all] of the plurality of key images [images, specified by the specifying controller, with respective feature values of the database images] to thereby calculate a first degree of similarity for each of said plurality of database images; [similarities therebetween;]

a second calculating controller for selecting a particular key image from the [plural] plurality of key images [specified by the specifying controller] and for comparing the particular key image with the plurality of database images to thereby calculate a second degree of similarity for each of the plurality of database images; [similarities therebetween;]

a third calculating controller for calculating a final degree of similarity for each of said plurality of database images for use in searching based on the [similarities] first and second degrees of similarity calculated respectively by the first and second calculating controllers; and

a searching controller for retrieving at least one of the plurality of database images, which is similar to the particular key image, based on the final degree of similarity calculated by the third calculating [controller.] controller for each of the plurality of database images.

8.   (Once Amended) [The] An image searching system as claimed in Claim 7, wherein the third calculating controller is operable to increase a weight of the first degree of similarity, calculated by the first calculating controller, to a value greater than

that of the <u>second</u> degree of similarity, calculated by the second calculating controller, to thereby calculate the final degree of similarity.

9.   (Once Amended) [The] <u>An</u> image searching system as claimed in [claim] <u>Claim</u> 8, wherein the first calculating controller is operable to extract [the] common [feature quantities] <u>features</u> of the image <u>that are</u> common to all of the key images, and to compare those common [feature quantities] <u>features</u> with <u>respective database image features of each of</u> the <u>plurality of</u> database [image] <u>images</u> to thereby calculate the <u>first</u> degree of similarity.

10.   (Once Amended) [The] <u>An</u> image searching system as claimed in Claim 9, wherein the second calculating controller is operable to select <u>from the plurality of key images a</u> [the] key [images] <u>image</u> most similar to <u>a desired image</u> [the database image from the key images] and to calculate the <u>second</u> degree of [similarity.] <u>similarity for each of the database images.</u>

11.   (Once Amended) An image searching method which comprises the steps of:

storing a plurality of database images [to be searched for] in a database;

specifying a plurality of key images used to specify search [conditions by means of a specifying controller;] <u>conditions;</u>

extracting [by means of an extracting controller,] common feature values [of common images] from the [plural] <u>plurality of</u> key [images specified by the specifying controller;] <u>images;</u>

comparing [by means of a calculating controller,] the common feature [values, extracted by the extracting controller,] <u>values</u> with the feature values of the [plural] <u>plurality of</u> database images to thereby sequentially calculate similarities between the common feature values and the database image feature values; and

retrieving from the <u>plurality of</u> database images <u>at least</u> one of the <u>plurality of</u> database images which is similar to the <u>plurality of</u> key [image,] <u>images</u> based on [a similarity calculated by the calculating controller, by means of a searching controller.] <u>the similarities for each of the plurality of database images.</u>

12.   (Once Amended) [The] <u>An image searching</u> method as claimed in Claim 11, wherein the extracting step includes the sub-steps [of] <u>of:</u>

extracting a plurality of types of [the feature quantities] <u>features</u> from the [respective] <u>plurality of</u> key [images specified by the specifying controller;] <u>images;</u>

comparing [by means of a selecting means] the [feature quantities, extracted by the extracting sub-step,] <u>features from</u> among the [plural] <u>plurality of</u> key images [specified by the specifying controller] to thereby select at least one of the types of the [feature quantities;] <u>features;</u> and

determining [the] common [feature quantities] <u>features</u> based on the at least one type of the <u>features.</u> [features quantities selected by the selecting means].

13.   (Once Amended) [The] <u>An image searching</u> method as claimed in Claim 12,

wherein the [selecting means is operable to compare the feature quantities] <u>step of comparing includes comparing features</u> of the [same types among the plural] <u>plurality of</u> key <u>images,</u> [images specified by the specifying controller] and

wherein the [determining means is operable to calculate] <u>step of determining includes calculating</u> an average value of the [feature quantities] <u>features</u> of the [plural] <u>plurality of</u> key [image] <u>images</u> with respect to the types of the <u>features</u> [feature quantities selected by the selecting means,] to thereby determine [the] <u>a</u> calculated average value as representing the common [feature quantities.] <u>features.</u>

14.   (Once Amended) An image searching method which comprises the steps of:

storing a plurality of database images [to be searched for] in an image [database;] <u>database, said plurality of database images each having a plurality of database feature values;</u>

specifying a plurality of key images used to specify search [conditions by means of a specifying controller;] <u>conditions, said plurality of key images having common features, said common features of said plurality of key images each having a key image feature value;</u>

comparing [by means of a calculating controller,] the <u>key image feature values of the plurality of key images</u> [plural images, specified by the specifying controller,] with

the [plural] <u>plurality of database feature values of the plurality of</u> database images to thereby calculate similarities between the [common] <u>key image</u> feature values and the <u>plurality of</u> database image feature values;

retrieving a particular key image from the [specified] <u>plurality of key</u> images based on the [similarities calculated by the calculating controller, by means of a selecting controller;] <u>similarities;</u> and

retrieving [the] images from the database images based on the similarity between the <u>particular</u> key <u>image</u> [image, selected by the selecting controller,] and the <u>plurality of</u> database <u>images.</u> [images, by means of a searching controller.]

15.   (Once Amended) [The] <u>An image searching</u> method as claimed in Claim 14,

wherein the [selecting controller is operable to select] <u>step of specifying includes selecting</u> as a particular one of the [plural] specified <u>plurality of</u> key [images,] <u>images</u> the key images which most resemble [to] the database images being searched for.

16.   (Once Amended) [The] <u>An image searching</u> method as claimed in Claim 15,

wherein the calculating controller is operable to calculate a plurality of types of the [feature quantities] <u>features</u> from the [plural] <u>plurality of</u> key images <u>to derive the common feature values</u> and then to calculate a degree of similarity by comparing the <u>common</u> feature [quantities] <u>values of each type of feature</u> with <u>corresponding feature values of</u> the <u>plurality of</u> database images for each [type,] <u>type of feature,</u> and

wherein the selecting controller selects, as the particular key image from the [plural] specified <u>plurality of key</u> images, the key images which most resemble [to] the <u>plurality of</u> database images being searched with respect to an average value of degrees of similarities calculated by the calculating [means] <u>controller</u> for each type of the [feature quantities.] <u>features.</u>

17.   (Once Amended) An image searching method which comprises the steps of:

storing a plurality of database images [to be searched for] in an image database; specifying a plurality of key images used to specify search [conditions by means

of a specifying controller;] conditions, said plurality of key images each having a plurality of common feature values, each of said common feature values corresponding to one of the features of the plurality of key images;

comparing the common feature values [all] of the plurality of key [images, specified by the specifying controller,] images with respective feature values of the plurality of database images to thereby calculate first similarities [therebetween, by means of a first calculating controller;] therebetween;

selecting [by means of a second calculating controller,] a particular key image from the [plural] plurality of key images [specified by the specifying controller] and [for] comparing the particular key image with the plurality of database images to thereby calculate second similarities therebetween;

[calculating, by means of a third calculating controller,] calculating a final similarity for use in searching based on the [similarities calculated respectively by the first and second calculating controllers;] first and second similarities; and

retrieving [by means of a searching controller,] one of the plurality of database images, which is similar to the particular key image, based on the final [similarity calculated by the third calculating controller.] similarity.

18. (Once Amended) [The] An image searching method as claimed in Claim 17, wherein [the third calculating controller is operable to increase] the step of calculating includes a step of increasing a weight of [the] a degree of the first similarity [similarity, calculated by the first calculating controller,] to a value greater than that of [the] a degree of the second similarity [similarity, calculated by the second calculating controller,] to thereby calculate the final [degree of] similarity.

19. (Once Amended) [The] An image searching method as claimed in [claim] Claim 18, wherein [the first calculating controller is operable to extract the common feature quantities] the step of comparing includes the step of extracting the features of the image which are common to all of the key images, and [to compare] comparing the common feature values of those common [feature quantities] features with respective feature values of each of the database [image] images to thereby calculate the [degree of similarity.] first similarities.

20.   (Once Amended) [The] An image searching method as claimed in Claim 19, wherein [the second calculating controller is operable to select] the step of selecting includes selecting the key images most similar to the database image [from the key images] and to calculate the [degree of] second similarity.

21.   (Once Amended) A software program including computer-executable instructions stored on a recording medium, [medium storing therein a computer-executable image searching program,] said program comprising:

instructions for storing a plurality of database images [to be searched for] in a database;

instructions for specifying a plurality of key images used to specify search [conditions by means of a specifying controller;] conditions;

instructions for extracting [by means of an extracting controller,] common feature values of [common images from] features of the [plural] plurality of key images; [images specified by the specifying controller;]

instructions for comparing [by means of a calculating controller,] the common feature values [values, extracted by the extracting controller,] with [the] feature values of the [plural] plurality of database images to thereby sequentially calculate similarities between the common feature values of the plurality of key images and the database image feature values; and

instructions for retrieving from the plurality of database images at least one of the database images which is similar to one of the key [image,] images based on [a similarity calculated by the calculating controller, by means of a searching controller.] the similarities.

22.   (Once Amended) [The] A software program including computer-executable instructions stored on a recording medium as claimed in Claim 21, wherein the instruction for extracting [controller] includes an instruction [extracting means] for extracting a plurality of types of the features [feature quantities] from [the] respective key images, [images specified by the specifying controller; a selecting means] an instruction for comparing the feature values for the extracted types of features of each one of the plurality of key images with the feature values for the extracted types of features for each of [quantities, extracted by the extracting sub-step, among] the [plural]

plurality of key images [specified by the specifying controller] to thereby select at least one of the types of the [feature quantities;] features; and [a determining means] an instruction for determining the common feature [quantities] values based on the at least one type of the [features quantities selected by the selecting means.] features.

23.   (Once Amended) [The] A software program including computer-executable instructions stored on a recording medium as claimed in Claim 22,
        wherein the [selecting means is operable to compare the feature quantities] instruction for comparing compares the features of [the] same types among the [plural] plurality of key images, [images specified by the specifying controller] and
        wherein the instruction for determining calculates [means is operable to calculate] an average value of the [feature quantities] features of each of the [plural] plurality of key [image] images with respect to the types of the features [feature quantities selected by the selecting means,] to thereby determine the calculated average value as [representing] the common feature [quantities.] values.

24.   (Once Amended) A software program including computer-executable instructions stored on a recording [medium storing therein a computer- executable image searching program,] medium, said program comprising:
        instructions for storing a plurality of database images [to be searched for] in an image [database;] database, wherein said instructions for storing also include instructions for storing a plurality of database image feature values for each of the plurality of database images;
        instructions for specifying a plurality of key images having common feature values used to specify search [conditions by means of a specifying controller;] conditions;
        instructions for comparing [by means of a calculating controller,] the plurality of key images [plural images, specified by the specifying controller,] with the [plural] plurality of database images to thereby calculate similarities between [the] common feature values of the plurality of key images and the database image feature values;
        instructions for retrieving a particular key image from the specified plurality of key images based on the [similarities calculated by the calculating controller, by means of a selecting controller;] similarities; and

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instructions for retrieving [the] images from the plurality of database images based on the similarity between the particular key image [image, selected by the selecting controller,] and the database images. [images, by means of a searching controller.]

25.   (Once Amended) [The] A software program including computer-executable instructions stored on a recording medium as claimed in Claim 24,

wherein the [selecting controller is operable] instructions for retrieving include instructions to select as [a] the particular key image one of the [plural specified] plurality of key [images, the key] images which most [resemble to] resembles the database images being searched for.

26.   (Once Amended) [The] A recording medium as claimed in Claim 25,

wherein each of said plurality of key images and each of said plurality of database images has a plurality of features associated therewith,

wherein the [calculating controller is operable] instruction for comparing includes instructions to calculate a plurality of types of the [feature quantities] features from the [plural] plurality of key images and then to calculate a degree of similarity by comparing the [feature quantities] features of the plurality of key images with [the] respective features of the database images for each [type,] type of the feature, and

wherein the [selecting controller selects,] instructions for retrieving include instructions for selecting, as the particular key image [from the plural specified images,] the key [images] image which most [resemble to] resembles one of the database images [being searched] with respect to an average value of [degrees of] the similarities [calculated by the calculating means] for each type of the features. [feature quantities.]

27.   (Once Amended) A software program including computer-executable instructions stored on a recording [medium storing therein a computer-executable image searching program,] medium, said program comprising:

instructions for storing a plurality of database images [to be searched for] in an image [database;] database, said database images each having a plurality of database image feature values;

instructions for specifying a plurality of key images used to specify search

[conditions] conditions, said plurality of key images each having a plurality of features;

instructions for calculating feature values for each of the plurality of key images from the plurality of features for each of the plurality of key images; [by means of a specifying controller;]

instructions for comparing [all] the feature values of each of the plurality of key images [images, specified by the specifying controller,] with respective feature values of the plurality of database images to thereby calculate first similarities between the feature values of the plurality of key images and the feature values of the plurality of database images; [therebetween, by means of a first calculating controller;]

instructions for selecting [by means of a second calculating controller,] a particular key image from the [plural] plurality of key [images specified by the specifying controller and] images;

instructions for comparing the feature values of the particular key image with the feature values of the plurality of database images to thereby calculate second similarities therebetween;

instructions for calculating [calculating, by means of a third calculating controller,] a final similarity [for use in searching] based on the first and second [similarities calculated respectively by the first and second calculating controllers;] similarities; and

instructions for retrieving [by means of a searching controller,] at least one of the plurality of database [images, which is similar to the particular key image,] images, based on the final [similarity calculated by the third calculating controller.] similarity.

28.　(Once Amended)　[The] A software program including computer-executable instructions stored on a recording medium as claimed in Claim 27, wherein the [third] instructions for calculating [controller is operable to increase a weight] a final similarity for each of the database images includes instructions for increasing a weighting of [the degree of similarity, calculated by the first calculating controller,] the first similarities, to a value greater than that of [the degree of similarity, calculated by the second calculating controller,] the second similarities, to thereby calculate the final [degree of] similarity.

29.   (Once Amended) [The] <u>A software program including computer-executable instructions stored on a</u> recording medium as claimed in [claim] <u>Claim</u> 28, wherein the <u>instructions for calculating include instructions for extracting</u> [first calculating controller is operable to extract the] common <u>features</u> [feature quantities of the image] common to all of the key images, and [to compare] <u>include instructions for comparing</u> those common [feature quantities] <u>features</u> with the <u>plurality of</u> database <u>images</u> [image] to thereby calculate the degree of <u>first similarities.</u> [similarity.]

30.   (Once Amended) [The] <u>A software program including computer-executable instructions stored on a</u> recording medium as claimed in Claim 29, wherein the [second calculating controller is operable to select] <u>instructions for calculating include instructions for selecting</u> the key images most similar to [the database image from the key images and to calculate the degree of similarity.] <u>a desired image.</u>

Claims 31-33 have been added.
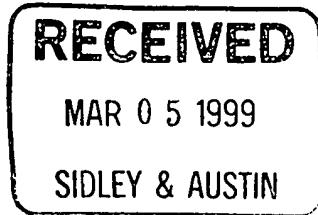
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(via express mail)

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Title: AN IMAGE SEARCHING SYSTEM AND IMAGE
SEARCHING METHOD, AND A RECORDING MEDIUM
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